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LEFT VENTRICULAR TRANSMURAL MECHANICS IN ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION FOLLOWING PRIMARY PERCUTANEOUS CORONARY INTERVENTION

ACC Poster Contributions
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Authors: *Giuseppe Caracciolo, Mackram Eleid, Nisha Bhatia, David F. Fortuin, Susan Wilansky, Scipione Carerj, Jagat Narula, Bijoy Khandheria, Partho P. Sengupta, Mayo Clinic Arizona, Scottsdale, AZ, Aurora Health Care, Milwaukee, WI*

Background: Wall motion score index (WMSI) provides an assessment of the radial component of regional left ventricular (LV) function and has been traditionally used as a prognostic marker for patients with ST-elevation myocardial infarction (STEMI). The aim of the study was to assess whether layer-specific deformation analysis by speckle tracking echocardiography was incremental to WMSI for defining the extent of improvement in LV function after primary percutaneous coronary intervention (PCI).

Methods: A total of 42 patients (63±11 years old, 69% male) with a first STEMI underwent serial assessments of LV longitudinal, circumferential and radial strains by selective tracking of subendocardial and subepicardial regions within 48 hours and ≥ 2 weeks after PCI. LV mechanical parameters were compared with 16 age and sex matched normal controls. Serial changes in global strains and WMSI were compared for predicting an improvement of LV ejection fraction (EF>5%) on follow-up.

Results: In comparison with controls, global endocardial and epicardial longitudinal strains were markedly attenuated at 48 hours following PCI ($p<0.001$) and improved during follow up in 24 (57%) patients (-9±3 vs. -13±5%, $p<0.001$ for endocardial longitudinal strains and -8±4 vs. -11±3%, $p=0.003$ for epicardial longitudinal strains respectively). Similarly, endocardial circumferential strains was improved at serial follow up (-14±5 vs. -19±7%, $p=0.01$), however radial strains and WMSI remained persistently abnormal. The change in absolute magnitude of endocardial longitudinal strains predicted the improvement in LV EF (odds ratio 1.21, CI 1.02-to-1.44, $p=0.02$), independent of the location of STEMI and the presence of underlying mutivessel disease.

Conclusions: Improvement in global LV function following PCI for STEMI occurs primarily by augmentation of LV longitudinal and circumferential shortening mechanics. Left ventricular radial mechanics remain persistently abnormal and may explain the limited ability of WMSI in charactering LV functional improvements following PCI.